

CLAIMS:

1. A remote communication device comprising:
communication circuitry configured to at least one of receive
communication signals and generate communication signals; and
an antenna coupled with the communication circuitry and
substantially tuned to first and second different frequency bands, the
antenna being configured to communicate wireless signals corresponding
to the communication signals including at least one of receiving wireless
signals and outputting wireless signals.

2. The remote communication device according to claim 1
wherein the antenna comprises a microstrip antenna.

3. The remote communication device according to claim 1
wherein the antenna is configured to electromagnetically communicate
with a return loss of less than or equal to approximately -9 dB within
the first and second frequency bands.

4. The remote communication device according to claim 1
further comprising a power supply coupled with the communication
circuitry.

1 5. The remote communication device according to claim 1
2 wherein the antenna is configured to receive the wireless signals, and
3 further comprising another antenna coupled with the communication
4 circuitry and substantially tuned to first and second different frequency
5 bands, the another antenna being configured to output wireless signals.

6
7 6. The remote communication device according to claim 5
8 wherein the another antenna is configured to communicate via
9 backscatter modulation.

10
11 7. The remote communication device according to claim 5
12 further comprising a quarter-wavelength transmission line coupled
13 intermediate the communication circuitry and the another antenna.

14
15 8. The remote communication device according to claim 1
16 wherein the communication circuitry comprises radio frequency
17 identification device circuitry.

18
19 9. The remote communication device according to claim 1
20 wherein the frequency bands are centered at approximately 915 MHz
21 and 2.45 GHz.

22
23 10. The remote communication device according to claim 1
24 wherein the antenna includes an impedance reduction conductor.

1 11. A remote communication device comprising:
2 communication circuitry configured to at least one of receive
3 communication signals and generate communication signals; and
4 an antenna coupled with the communication circuitry and
5 configured to communicate wireless signals corresponding to the
6 communication signals including at least one of receiving wireless signals
7 and outputting wireless signals, the antenna being configured to
8 communicate at a plurality of substantially resonant frequencies.
9

10 12. The remote communication device according to claim 11
11 wherein the antenna is substantially tuned to the resonant frequencies.
12

13 13. The remote communication device according to claim 11
14 wherein the antenna is configured to electromagnetically communicate
15 with a return loss of less than or equal to approximately -9 dB at the
16 first and second frequencies.
17

18 14. The remote communication device according to claim 11
19 wherein the antenna is configured to receive the wireless signals, and
20 further comprising another antenna coupled with the communication
21 circuitry and configured to output the wireless signals at a plurality of
22 substantially resonant frequencies.
23
24

1 15. The remote communication device according to claim 14
2 wherein the another antenna is configured to communicate via
3 backscatter modulation.

4
5 16. The remote communication device according to claim 11
6 wherein the antenna includes an impedance reduction conductor.

7
8 17. The remote communication device according to claim 11
9 wherein the communication circuitry comprises radio frequency
10 identification device circuitry.

11
12 18. A radio frequency identification device comprising:
13 communication circuitry configured to at least one of receive
14 communication signals and generate communication signals; and
15 an antenna coupled with the communication circuitry and
16 configured to electromagnetically communicate having a return loss less
17 than or equal to approximately -9 dB at a plurality of frequencies, the
18 antenna being configured to communicate wireless signals corresponding
19 to the communication signals including at least one of receiving the
20 wireless signals and outputting the wireless signals.

1 19. The radio frequency identification device according to
2 claim 18 wherein the antenna is configured to receive the wireless
3 signals, and further comprising another antenna coupled with the
4 communication circuitry and substantially tuned to a plurality of
5 frequencies, the another antenna being configured to output the wireless
6 signals.

8 20. The radio frequency identification device according to
9 claim 19 wherein the another antenna is configured to communicate via
10 backscatter modulation.

12 21. The radio frequency identification device according to
13 claim 18 wherein the antenna includes an impedance reduction
14 conductor.

1 22. A radio frequency identification device comprising:
2 communication circuitry configured to receive communication signals
3 and to generate communication signals;

4 a first antenna coupled with the communication circuitry and
5 substantially tuned to a plurality of frequencies, the first antenna being
6 configured to receive wireless signals corresponding to the received
7 communication signals; and

8 a second antenna coupled with the communication circuitry and
9 substantially tuned to a plurality of frequencies, the second antenna
10 being configured to output wireless signals corresponding to the
11 generated communication signals.

12
13 23. The radio frequency identification device according to
14 claim 22 wherein the antennas are individually configured to
15 electromagnetically communicate with a return loss of less than or equal
16 to approximately -9 dB at individual ones of the plurality of frequencies.

17
18 24. The radio frequency identification device according to
19 claim 22 wherein the second antenna is configured to communicate via
20 backscatter modulation.

21
22 25. The radio frequency identification device according to
23 claim 22 wherein the antennas individually include an impedance
24 reduction conductor.

1 26. A radio frequency identification device comprising:
2 communication circuitry configured to at least one of receive
3 forward signals from an interrogator and generate return signals; and
4 an antenna coupled with the communication circuitry and
5 configured to communicate wireless signals at one of a plurality of
6 frequencies including at least one of receiving the forward signals and
- outputting the return signals.

8
9 27. The radio frequency identification device according to
10 claim 26 wherein the antenna is configured to communicate at the one
11 frequency responsive to a frequency of communication of the
12 interrogator.

13
14 28. The radio frequency identification device according to
15 claim 26 wherein the antenna is configured to receive the forward
16 signals, and further comprising another antenna coupled with the
17 communication circuitry and configured to output the return signals at
18 one of a plurality of frequencies.

19
20 29. The radio frequency identification device according to
21 claim 28 wherein the another antenna is configured to communicate via
22 backscatter modulation.

1 30. The radio frequency identification device according to
2 claim 26 wherein the antenna includes an impedance reduction
3 conductor.

4
5 31. A wireless communication system comprising:
6 an interrogator configured to emit forward signals; and
7 a remote communication device configured to at least one of
8 receive the forward signals from the interrogator and generate return
9 signals for communication to the interrogator, the remote communication
10 device being configured to communicate wireless signals including at
11 least one of receiving the forward signals and outputting the return
12 signals at a plurality of frequencies.

13
14 32. The wireless communication system according to claim 31
15 wherein the interrogator is configured to output the forward signals at
16 one of the frequencies.

17
18 33. The wireless communication system according to claim 31
19 wherein the remote communication device is configured to communicate
20 at one of the plurality of frequencies responsive to a frequency of
21 communication of the interrogator.

1 34. The wireless communication system according to claim 31
2 wherein the remote communication device includes an antenna
3 substantially tuned to the frequencies.

4
5 35. The wireless communication system according to claim 34
6 wherein the antenna is configured to receive the forward signals, and
7 the remote communication device includes another antenna substantially
8 tuned to the frequencies and configured to output the return signals.

9
10 36. The wireless communication system according to claim 35
11 wherein the antennas individually include an impedance reduction
12 conductor.

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14 37. The wireless communication system according to claim 31
15 wherein the remote communication device comprises a radio frequency
16 identification device.

17
18 38. A wireless communication method comprising:
19 providing a remote communication device having an antenna
20 substantially tuned to first and second different frequency bands; and
21 communicating wireless signals using the antenna including at least
22 one of receiving wireless signals at a frequency within one of the
23 frequency bands and outputting wireless signals at a frequency within
24 one of the frequency bands.

1 39. The method according to claim 38 wherein the providing
2 comprises providing a remote communication device having the antenna
3 configured to electromagnetically communicate with a return loss of less
4 than or equal to approximately -9 dB within the first and second
5 frequency bands.

6
7 40. The method according to claim 38 wherein the providing
8 comprises providing a remote communication device having a plurality
9 of antennas individually substantially tuned to first and second different
10 frequency bands.

11
12 41. The method according to claim 40 wherein the
13 communicating comprises receiving using one of the antennas and
14 outputting using another of the antennas.

15
16 42. The method according to claim 38 further comprising
17 processing wireless signals using the remote communication device.

18
19 43. The method according to claim 38 wherein the providing
20 comprises providing a radio frequency identification device.

1 44. A wireless communication method comprising:
2 providing a remote communication device having an antenna
3 configured to communicate at a plurality of resonant frequencies; and
4 communicating wireless signals using the antenna including at least
5 one of receiving wireless signals at one of the frequencies and
6 outputting wireless signals at one of the frequencies.

8 45. The method according to claim 44 wherein the providing
9 comprises providing a remote communication device having the antenna
10 configured to electromagnetically communicate with a return loss of less
11 than or equal to approximately -9 dB at the plurality of frequencies.

13 46. The method according to claim 44 wherein the providing
14 comprises providing a remote communication device having a plurality
15 of antennas individually substantially tuned to the plurality of
16 frequencies.

18 47. The method according to claim 46 wherein the
19 communicating comprises receiving using one of the antennas and
20 outputting using another of the antennas.

22 48. The method according to claim 44 further comprising
23 processing wireless signals using the remote communication device.

1 49. The method according to claim 44 wherein the providing
2 comprises providing a radio frequency identification device.

3
4 50. A radio frequency identification device communication method
5 comprising:

6 providing a radio frequency identification device configured to
7 communicate wireless signals at a plurality of frequencies;

8 receiving forward signals at one of the frequencies; and

9 outputting return signals at one of the frequencies.

10
11 51. The method according to claim 50 wherein the providing
12 comprises providing a radio frequency identification device having one
13 antenna substantially tuned to the frequencies and configured to receive
14 the forward signals and another antenna substantially tuned to the
15 frequencies and configured to output the return signals.

16
17 52. The method according to claim 50 further comprising
18 processing wireless signals using the radio frequency identification device.

19
20 53. The method according to claim 50 wherein the receiving and
21 outputting occur at the same frequency.

1 54. A wireless communication method comprising:
2 communicating a forward link signal at one of a plurality of
3 frequencies using an interrogator;
4 receiving the forward link signal using one antenna of a remote
5 communication device substantially tuned to the plurality of frequencies;
6 and
7 outputting a return link signal using another antenna of the
8 remote communication device substantially tuned to the plurality of
9 frequencies.

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11 55. The method according to claim 54 further comprising
12 processing wireless signals using the remote communication device.

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14 56. The method according to claim 54 wherein the receiving and
15 outputting comprise receiving and outputting using a radio frequency
16 identification device.

1 57. A method of forming a remote communication device
2 comprising:

3 providing communication circuitry configured to at least one of
4 receive forward signals and output return signals;

5 coupling at least one antenna with the communication circuitry;
6 and

7 substantially tuning the at least one antenna to communicate at
8 a plurality of frequencies.

9
10 58. The method according to claim 57 further comprising
11 coupling a power supply with the communication circuitry.

12
13 59. The method according to claim 57 wherein the providing
14 comprises providing radio frequency identification device communication
15 circuitry.

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17 60. The method according to claim 57 wherein the coupling
18 comprises coupling a plurality of antennas with the communication
19 circuitry, one of the antennas being configured to receive wireless signals
20 corresponding to the forward signals and the other of the antennas
21 being configured to communicate wireless signals corresponding to the
22 return signals.

1 61. The method according to claim 57 wherein the tuning
2 comprises tuning using an impedance reduction strip.

3
4 62. A radio frequency identification device communication method
5 comprising:

6 providing an interrogator;

7 communicating a forward signal at one of a plurality of
8 frequencies using the interrogator;

9 providing a radio frequency identification device configured to
10 communicate with interrogator;

11 receiving the forward signal using one antenna of the radio
12 frequency identification device substantially tuned to the plurality of
13 frequencies;

14 processing the forward signal using communication circuitry of the
15 radio frequency identification device after the receiving;

16 outputting a continuous wave signal using the interrogator after
17 the communicating;

18 generating a return signal using the communication circuitry after
19 the processing; and

20 modulating the continuous wave signal according to the return
21 signal using another antenna of the radio frequency identification device
22 substantially tuned to the plurality of frequencies.